twenty-one foot stage, and refused to be stampeded. The results entirely vindicated their faith in the bureau's prediction.

Sunday evening, after the heavy downpour, when the river stood almost on a level with North Kansas Avenue, many of the north siders were almost panic-stricken but in half an hour's time the Weather Bureau had received reports from its observers upstream that showed there was no chance for an overflow from this rain and North Topeka went to bed feeling that its levess would take care of all the water that was coming. This particular warning cost the Weather Bureau exactly 90 cents in telegraph and telephone tolls and a few hours of the hardest kind of work on the part of employees already worn out with long vigil over flood conditions, but it saved North Topeka upwards of $25,000, besides all the inconvenience of moving out and moving back again.

Warnings for other sections were equally accurate and allayed the fears of thousands of people who had become panic-stricken through unfounded and grossly exaggerated rumors.

South Platte and Loup Rivers of Nebraska.—(From report of Mr. M. V. Robins, Omaha, Nebr.) Early in this report it was stated that floods occurred in northeastern Colorado. The flood waters in the South Platte River moved through the State of Nebraska, causing a considerable rise in the river. Warnings were first issued on June 13, and again on June 15, 16, 17, and 18. The flood was a moderate one, and the only damage reported, amounting to about $5,500, was in the vicinity of Ogallala, Nebr., with an offset of $1,500 worth of property saved through the warnings. At North Platte, Nebr., no damage was done, and the money value of property saved by the warnings was $50,000.

On June 18 there were more heavy rains over the upper South Platte drainage area and that of the Loup River in Nebraska, and warnings were again issued on June 19. This flood caused considerable damage along the Platte River (below North Platte, Nebr.), and in the Loup Valley, the total amounting to about $300,000, mainly to crops and live stock. It was impossible to obtain estimates of the value of property saved through the warnings, but it was reported that a number of herds of cattle was saved.

These floods were the first since the recent organization of flood service along the Platte River, and the success attending the warnings was very gratifying. It became apparent that some further extensions are necessary if the needs of the people are to be met, and additions will be made if funds can be obtained.

The Platte, Kansas, and Osage floods were just about sufficient to bring the Missouri River to approximate flood stages from Kansas City eastward. Some warnings were issued at the proper time and apparently little or no damage was done.

The Santee River of South Carolina fell below the flood stage on June 12. The river had been above flood stage so long that no crops of consequence had been planted in the lowlands, and livestock kept within bounds. There were therefore no losses. The local floods in the Oconee, Ocmulgee and Flint Rivers of Georgia and in the Apalachicola River of Florida were unimportant.

The St. Francis River of Arkansas reached the flood stage of 17 feet at Marked Tree, Ark., on May 18, and did not fall below that stage until June 19. The highest stage was 19.1 feet from May 28 to June 1. Warnings were first issued on May 16, and thereafter as occasion required, the last on June 11, after the heavy rains of June 10–11.

The flood was not as destructive as its height and the season of the year would indicate. The absence of high stages in the Mississippi River prevented ponding in the lower reaches and the wet spring had seriously retarded farming operations. About 10,000 acres of land were overflowed and their crops destroyed, although perhaps one-half was replanted to corn. Lumbering operations were aided in some localities and hindered in others. The most serious loss was in farm labor which moved away from the flooded area and for the most part failed to return.

Losses were about $275,000, of which $200,000 was in crops about equally divided between mature and prospective yields. Property to the value of $50,000, was saved through the warnings.

The Yazoo River flood ended about July 4, the river having been in flood since March 1. The only losses resulted from the overflow of about 1,500 acres of cultivable lands, and were, of course, prospective. They were estimated at $15,000.

Five hundred and sixty-eight square miles of land in the lower basin were overflowed by backwater from the Mississippi River, but owing to the frequency of floods, cultivation of the lands in this section has virtually been abandoned, There still remain about 2,140 square miles that are protected from overflow.

LOW WATER IN THE MISSISSIPPI RIVER DURING JUNE, 1923, IN THE DAVENPORT, IOWA, DISTRICT.

By A. M. HAMRICK, Meteorologist.

[Weather Bureau, Davenport, Iowa.]

During June, 1923, the Mississippi River was far below the average stage for that month in the Davenport, Iowa, district. Gage readings at Davenport show that in only four of the last fifty years have June river stages averaged lower than this year. The lowest water for any June occurred in 1900, when the daily gage readings averaged 2.2 feet, with a low stage for the month of 1.4 feet, and a high stage of 3.2 feet. The other three low-water Junes were: 1891, with an average stage of 2.8 feet; 1910, with an average stage of 3.1 feet; and 1887, with an average stage of 3.2 feet. In June, 1923, the average river stage was 3.5 feet, with a high reading of 4.3 feet, and a low reading of 3 feet.

The normal stage of the Mississippi River for June at Davenport, as determined from the records of the last 50 years, is 7.24 feet.

No flood occurred in this section of the Mississippi River during the spring of 1923, although the April stages averaged slightly above normal. The May stages were 1.7 feet below normal.

The total rainfall at Davenport during May was 3.60 inches, 0.59 inch below normal, and during June it was 6.03 inches, or 1.92 inches above normal. A drought prevailed throughout this section of the Mississippi Valley during April, and the heavy rains in May and June had very little effect upon the stages of the river.

The accompanying table gives the average daily river stages at Davenport for June for the last 50 years.

	Average stage (feet).		Average stage (feet).
June 1873	11.2	1899	9.2
1874	5.5	1900	2.2
1875	7.3	1901	3.6
1876	9.5	1902	7.3
1877	5.4	1903	9.9
1878	5.1	1904	8.1
1879	5.4	1905	11.3
1880	12.3	1906	9.6
1881	8.2	1907	7.0
1882	8.8	1908	11.5
1883	8.1	1909	8.4
1884	6.8	1910	3.1
1885	6.5	1911	4.4
1886	4.3	1912	6.8
1887	3.2	1913	6.3
1888	10.7	1914	7.7
1889	4.2	1915	7.9
1890	9.0	1916	11.3
1891	2.8	1917	7.5
1892	14.8	1918	8.2
1893	8.0	1919	6.1
1894	6.8	1920	7.2
1895	3.5	1921	5.9
1896	7.9	1922	4.8
1897	5.9		
1898	5.5	50-year mean	7.24

As a result of the excessive rains of June 9–10, the upper Trinity River of Texas overflowed low places from

above Bridgeport to below Trinidad from June 10 to 23, inclusive. The crest stages were not unusually high, and flood stages occurred only above Long Lake. The crest reached the mouth of the river on July 3. The total reported losses were $20,000, while property to the value of $49,000, was reported saved by the flood warnings.

Colorado drainage, Colorado and Utah, etc.—(From report by Mr. F. W. Brist, Denver, Colo.) Owing to the prevailing high temperatures at high elevations warnings of moderate floods were issued on June 14 for the upper Colorado River and its tributaries. These warnings were well verified, and crest stages were reached between June 16 and 18.

Notice of decreasing stages at Yuma, Ariz., by June 10, was sent to lower Colorado River points on June 7. The crest of 25.4 feet occurred on June 10. Another rise set in on June 13, and warnings were again issued on June 16 for a discharge of 92,000 second-feet by June 28. The maximum discharge was 92,000 feet on June 27, with a stage of 24.3 feet. At Grand Canyon, Ariz., 100,000 second-feet was forecast by June 19, with a crest of 25.5 feet, and on June 18 and 19, the discharge was 98,800 second-feet, with a stage of 24.9 feet.

On June 22 it became evident that the melting of snow over the upper area had about ceased, and a decreasing stage at Yuma after June 27 was forecast. The crest stage at Yuma was 25.4 feet on June 8 and 10.

Annual rise of the Columbia River.—The Columbia and extreme lower Willamette Rivers were still in flood at the close of the month, and the report on the flood will appear in the MONTHLY WEATHER REVIEW for July, 1923.

Flood stages during June, 1923.

River and station.	Flood stage.	Above flood stages—dates. From—	To—	Crest. Stage.	Date.
ATLANTIC DRAINAGE.					
Santee:	*Feet.*			*Feet.*	
Rimini, S. C.	12	(1)	11	14.1	4
Ferguson, S. C.	12	(1)	12	13.3	5
Oconee:					
Milledgeville, Ga.	22	(1)	1	23.8	1
Ocmulgee:					
Macon, Ga.	18	(1)	1	18.0	1
Abbeville, Ga.	11	(1)	10	14.9	3-4
Lumber City, Ga.	15	5	10	17.2	7
EAST GULF DRAINAGE.					
Apalachicola:					
River Junction, Fla.	12	(1)	10	16.3	1
Flint:					
Albany, Ga.	20	(1)	2	21.0	1
Tombigbee:					
Lock No. 4, Ala.	39	(1)	5	46.4	2
Pearl:					
Jackson, Miss.	20	(1)	5	23.0	3
West Pearl:					
Pearl River, La.	13	(1)	6	14.7	1-2
MISSISSIPPI DRAINAGE.					
White, W. Fork:					
Edwardsport, Ind.	10	1	1	11.7	1
Holston, N. Fork:					
Mendota, Va.	8	12	14	14.8	13
St. Francis:					
Marked Tree, Ark.	17	(1)	19	19.1	1
Arkansas:					
Fort Lyon, Colo.	6	4	4	6.0	4
Do.	6	8	8	6.4	8
Do.	6	17	17	10.0	17
Wichita, Kans.	9	9	15	13.5	10
Ralston, Okla.	12	3	4	12.6	3
Do.	12	10	18	23.0	11
Tulsa, Okla.	16	12	14	19.8	13
Webbers Falls, Okla.	23	12	20	29.4	14
Fort Smith, Ark.	22	11	21	29.4	15
Dardanelle, Ark.	20	(1)	1	20.0	1
Do.	20	12	23	26.5	17
Little Rock, Ark.	23	14	22	25.3	18
Pine Bluff, Ark.	25	(1)	1	25.0	1
Do.	25	15	25	27.7	19-20
Little Arkansas:					
Sedgwick, Kans.	18	9	13	24.7	11
Do.	18	18	19	18.5	19

[1] Continued from May.

Flood stages during June, 1923—Continued.

River and station.	Flood stage.	Above flood stages—dates. From—	To—	Crest. Stage.	Date.
MISSISSIPPI DRAINAGE—continued.					
Neosho:	*Feet.*			*Feet.*	
Neosho Rapids, Kans.	22	10	14	27.0	11
LeRoy, Kans.	24	10	16	27.3	13
Iola, Kans.	15	10	17	19.5	15
Oswego, Kans.	17	10	22	22.2	16, 19-20
Wyandotte, Okla.	23	15	15	24.5	15
Yonkers, Okla.	14	10	.....	27.6	16
Fort Gibson, Okla.	22	10	21	32.0	14
Cottonwood:					
Emporia, Kans.	20	10	14	25.1	10
Canadian:					
Canadian, Tex.	5	9	9	5.5	9
Union City, Okla.	7	10	10	8.2	10
North Canadian:					
Woodward, Okla.	3	1	14	8.3	10
Canton, Okla.	4	3	3	5.0	3
Do.	4	9	11	8.6	10
Reno Junction, Okla.	12	12	13	14.0	12
Oklahoma City, Okla.	12	(1)	1	12.1	1
Do.	12	7	9	13.5	7
Do.	12	12	17	16.3	14
Petit Jean:					
Danville, Ark.	20	11	13	22.2	12
White:					
Newport, Ark.	26	(1)	1	26.6	1
Georgetown, Ark.	22	(1)	20	25.8	1
Clarendon, Ark.	30	(1)	8	30.4	3-5
Black:					
Black Rock, Ark.	14	(1)	21	20.3	12
Cache:					
Patterson, Ark.	9	(1)	3	9.9	1
Do.	9	10	23	10.2	12-13
Yazoo:					
Yazoo City, Miss.	25	(1)	(2)	28.3	6-13
Tallahatchie:					
Swan Lake, Miss.	25	(1)	21	28.5	1
Missouri:					
Waverly, Mo.	23	13	14	23.2	13
St. Charles, Mo.	25	15	17	25.7	17
Meramec:					
Pacific, Mo.	11	18	18	12.0	18
Kansas:					
Topeka, Kans.	21	10	10	21.6	10
Smoky Hill:					
Lindsborg, Kans.	19	10	11	21.2	11
Solomon, Kans.	24	11	14	25.9	13
Solomon:					
Beloit, Kans.	13	9	14	24.4	12
Niles, Kans.	24	11	12	26.6	11
Republican:					
Scandia, Kans.	10	12	12	11.4	12
Clyde, Kans.	17	13	13	17.2	13
Wakefield, Kans.	12	5	5	12.4	5
Do.	12	14	14	12.2	14
Blue:					
Blue Rapids, Kans.	20	11	11	21.4	11
Grand:					
Brunswick, Mo.	10	10	17	12.5	15
Do.	10	29	(2)	11.1	30
Osage:					
Ottawa, Kans.	24	11	13	28.1	12
Osceola, Mo.	20	17	18	20.2	17
Warsaw, Mo.	22	15	18	23.4	17
WEST GULF DRAINAGE.					
Trinity:					
Dallas, Tex.	25	11	18	37.5	12
Trinidad, Tex.	28	14	23	39.3	17-18
Rio Grande:					
San Marcial, N. Mex.	1	(1)	5	1.6	1
Do.	1	11	14	1.2	12
Do.	1	18	22	1.0	18-22
COLORADO DRAINAGE.					
Colorado:					
Lees Ferry, Ariz.	12	(1)	(2)	17.0	1
Topock, Ariz.	14	(1)	10	17.5	3
Do.	14	19	23	15.2	22
Parker, Ariz.	7	(1)	(2)	10.4	23
Roaring Fork:					
Carbondale, Colo.	5	17	18	5.2	18
Do.	5	26	26	5.0	26
Green:					
Elgin, Utah.	12	(1)	4	12.9	1
Do.	12	15	19	12.2	16-17
COLUMBIA BASIN DRAINAGE.					
Columbia:					
Marcus, Wash.	24	(1)	(2)	30.1	18-19
Wenatchee, Wash.	40	17	19	40.6	19
Vancouver, Wash.	15	(1)	(2)	20.6	16-17
Kootenai:					
Bonners Ferry, Idaho.	26	11	17	27.4	14
Pend Oreille:					
Newport, Wash.	16	15	20	16.2	16-18
Willamette:					
Portland, Oreg.	15	(1)	(2)	19.8	16

[1] Continued from May. [2] Continued into July.